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The Black Widow Spider

(Latrodectus mactans Fabr.*)*

By
Don C. Mote and Kenneth Gray

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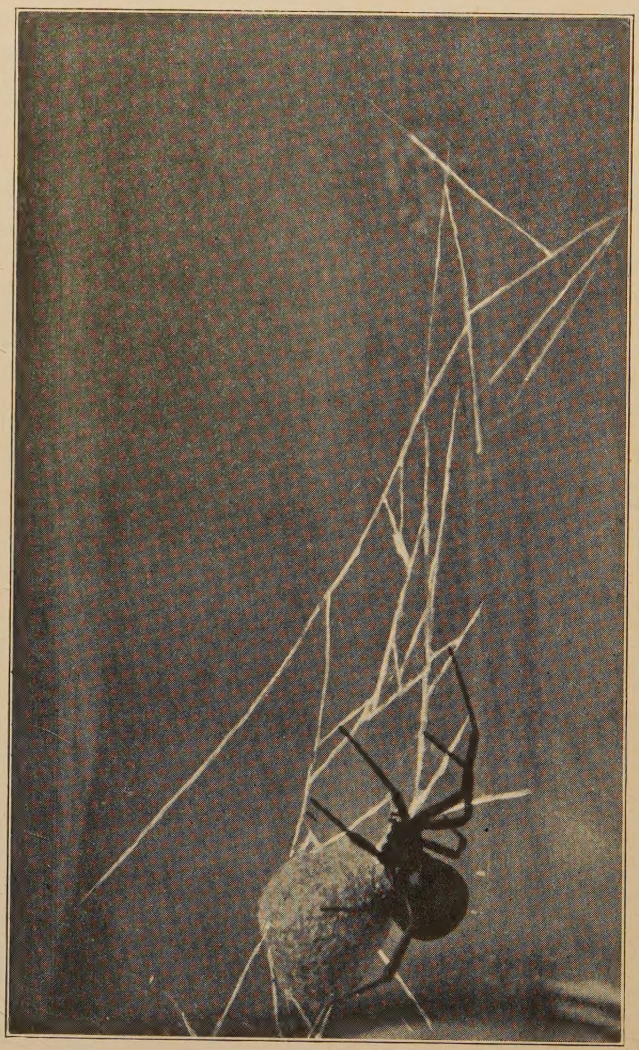

THE BLACK WIDOW GUARDS HER NEST

Although apparently on guard, the black widow conducts herself with all the timidity and shyness common to most of the other spiders. She spins an irregular web of large, coarse strands and constructs from four to nine silken cocoons or egg sacs during the summer.

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THE purpose of this circular is to answer the constantly increasing number of letters and calls requesting the determination of and information on the life habits and control of the black widow spider, *Latrodectus mactans* Fabr. This infamous spider has been present in Oregon for many years but has attracted very little attention until recently. Last year it became unusually numerous in its normal habitat and was taken in localities in which it had not heretofore been known to occur. A few cases of spider bites requiring medical attention were reported.

Black widow described. In view of the fact that certain insects and many innocent and harmless spiders were sent the laboratory during the past summer's outbreak of the black widow, a brief description of the spider and its near relatives is in order.

Spiders and insects belong to the same division of the animal kingdom. Both are air-breathing Arthropods. Spiders have the head and thorax usually grown together; they have four pairs of legs and no antennae. Insects have the head, thorax, and abdomen distinct; they have three pairs of legs and one pair of antennae.

Figure 1. The Comb. 10 x.

The comb on the last segment of the fourth pair of legs is used in pulling the web from the spinnerets and swiftly throwing it around the unhappy insect that strays too near the web of the female black widow.

The black widow belongs to a family of spiders commonly known as the comb-footed spiders, so-named because of the comb-like structure on the last or terminal segment of the fourth pair of legs (Figure 1). This comb is used for throwing the strands of web over the prey. Each leg has three claws at the end of the last or tarsal segment. These spiders also have eight eyes. A number of the comb-footed spiders occur so commonly in houses that they are known as house spiders. Some of these house spiders closely resembling the black widow in general form, size, and color, except for the colored markings on the underside of the abdomen, occur in Oregon. Since the colored markings apparently are indistinct or absent in some of the black widow spiders, the two species may be confused. The genus *Latrodectus* (black widow), however, can be recognized readily by the fact that its side or lateral eyes are far apart while those of its near relatives almost touch each other (Figure 2).

The female black widow spider is 1½ to 2 inches long, legs extended,

glossy, coal-black, round-bodied, and long-legged in contrast to the shorter-legged, depressed angular form of many spiders. The head and thorax are very small in contrast to the large, round, shiny black, shoe-button-like abdomen. This resemblance of the abdomen to a shoe button gives the spider one of its popular names, the "shoe button" spider. The underside

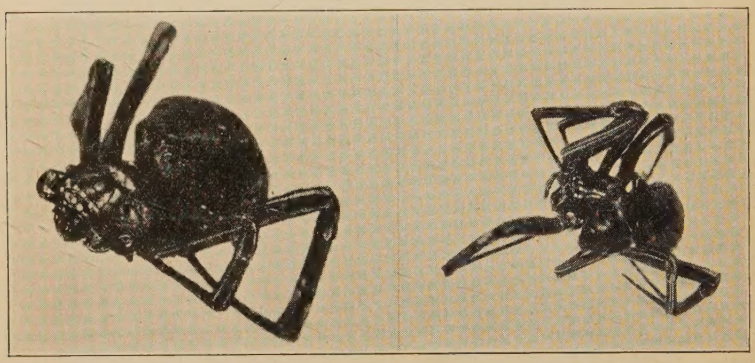

Figure 2. *Left:* The lateral eyes of the black widow spider are far apart. *Right:* The eyes of the near relatives nearly touch each other.

of the abdomen is marked with one or more red spots which vary in number, size, and shape, or may be absent. The most constant mark is one shaped somewhat like an hour glass, from which is derived another popular name, the "hour glass" spider (Figure 3).

The male is much smaller than the female, ¼ inch in length, and even more conspicuously marked (Figure 4). In addition to the ventral mark of the female, it has several pairs of whitish stripes with pale brown intervals along the sides of the abdomen.

Curiously, the younger stages of both sexes show markings similar to those on the male.

The web resembles that of other closely related house spiders in that it has no pattern or design. It consists of an irregular helter-skelter arrangement of coarse strands of silk. The strands are much coarser than are those of other spiders.

The spider widely distributed in the United States. The black widow, formerly common only in the South, has spread to other sections of the United States and Canada. It is reported as occurring in the northern states of Washington, Idaho, Montana, Colorado, North Dakota, Michigan, Indiana, Ohio, Pennsylvania, New York, and New Hampshire.

In Oregon it apparently occurs in greatest abundance east of the Cascade Range, but it has been taken also in the counties of Multnomah, Yamhill, Polk, Benton, Douglas, and Josephine.

Occasionally found in residences in cities. In the literature, the black widow is said to spin its web in dimly lighted places such as under stones, pieces of wood on the ground, about stumps, in holes, deserted ground-

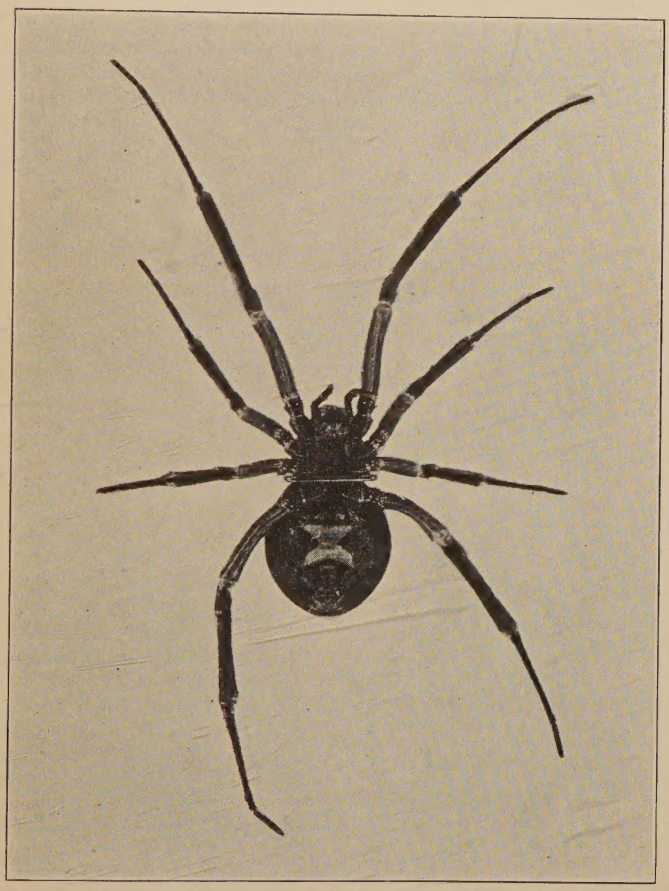

Figure 3. The "Hour Glass."

The underside of the abdomen of the female is marked with one or more red spots. The most constant mark is one shaped like an hour glass.

squirrel burrows, and in out buildings. During the present outbreak it has often been taken in the basements of residences and other buildings that are frequently occupied.

Walter A. Holt, Umatilla county agent, reports that the spiders brought into his office for examination were found "at various places around buildings, including basements, porches, and foundations, old piles of lumber, and in barns." "Well curbings have provided shelter for a few of the spiders, especially abandoned wells or where conditions were particularly dry."

Two specimens taken under rocks in a rock garden are reported by L. P. Wilcox, Jackson county agent.

Reports by E. M. Hauser, assistant county agent, Malheur county, indicate that 50 per cent of the specimens brought in for identification came

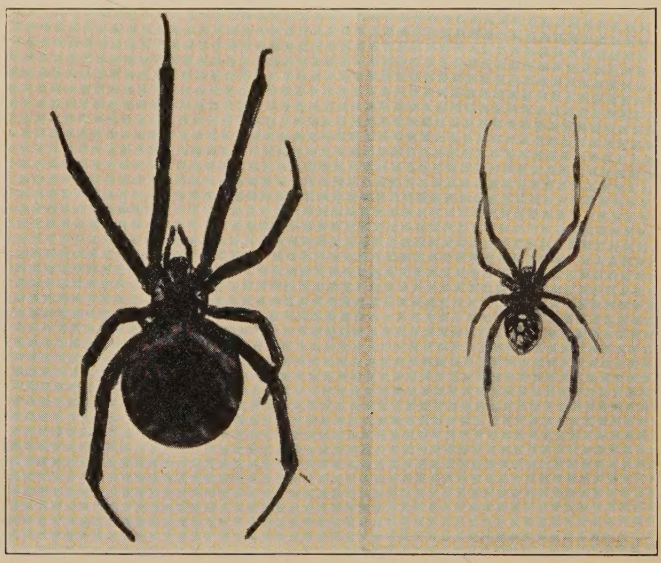

Figure 4. The head and the thorax of the female (left) are very small in contrast to the large, round, shiny black shoe-button-like abdomen. The male (right) has a red or pale-brown stripe along the middle of the back and may have a series of stripes along the sides of the abdomen.

from basements of residences, 35 per cent from garages and other out buildings infrequently used, and the remainder from wood piles and in a few instances from lumber piles.

Most of the black widows that were brought into the office of C. A. Henderson, Klamath county agent, came from rock walls, piles of rock, piles of lumber, or from under boards or other debris adjacent to dwellings. "Quite a number have also been taken from the dark corners of basements. One was found in a basement near the door where it was open and light. Another one was found in the back hallway on the ceiling. Another was found wandering around the backyard at noon of a warm sunny day. Another was found under an old weather vane under the back porch."

Of the specimens taken in the vicinity of Corvallis, one was found in a commercial garage in Corvallis, two were taken in water meter boxes in the city of Philomath, and one in a rock pile in a vacant field near Corvallis.

Quite a number are reported by H. H. Stage, Associate Entomologist, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, as taken in a railway freight warehouse in Portland.

Life habits described. The black widow spins an irregular, tangled web of large, coarse strands with a funnel-shaped tube usually leading into the web from a place in which the spider is concealed. The web is both a snare or trap to catch flies and other insects, and a nursery for rearing the young.

From 4 to 9 silken egg sacs or cocoons are constructed during the summer, hung balloon-like in the web, and carefully guarded by the female. Mr. John Pierson, assistant in the Department of Entomology, Oregon State College, who has been collecting and studying the habits of the black widow, reports that each cocoon contains approximately 300 eggs. In about 30 days after the eggs are laid, hundreds of tiny gray spiders swarm out of the cocoon with ravenous appetites, attacking plant lice and other insects at once, even feeding upon each other. The young spiders grow rapidly, increasing in size with each molt, but are said not to attain full maturity until the next spring.

Food habits are the same as those of other spiders. The black widow however, does appear to have a more virulent paralyzing effect on the prey. Its actions consequently are more aggressive in biting the victim, according to C. B. Philip, Associate Entomologist, U. S. Public Health Service. "Frequently little effort is expended in wrapping the prey with web, following ensnarement, the spider preferring to stand by after biting an appendage of the victim until its struggles have ceased. This apparent reliance on its venom to paralyze its prey and its readiness to bite anything disturbing the web not too violently, may explain its seeming aggressiveness or relative frequency of reported bites of persons compared to lack of authentic reports of attack by other web spinning species." Some students say the black widow is a timid animal because it retreats into its hiding place when disturbed. Baerg says it is not disposed to bite readily. In fact, he had to coax the spider to bite his finger.

Entomologist allows spider to bite him for Science' sake. Mr. W. J. Baerg, Entomologist, University of Kansas, permitted a black widow to bite his finger for several seconds. "From the point of view of the experimenter, the results were all that could be desired", reports Baerg; "from the subject's point of view, they were slightly severe." The first effect of the spider bite was sharp, piercing, and painful. The area near the bite at first turned white (as after a bee sting), but in a short time became very red and slightly swollen. In about fifteen minutes an aching pain developed in the tendons of the left shoulder; a half hour later the entire arm felt lame and the aching was more marked. In two hours the pain in the left hand was severe, a sharp burning sensation, and the pain in the muscles had extended to the chest. Four hours after the bite, the severe aching pain had extended to the hips and legs, the chest felt cramped, breathing and speech were forced and irregular. Others have described the pain at this time as excruciating or agonizing, and commonly continuous but occasionally

cramp-like or intermittent. A mild fever and slight rise in body temperature occurs. Profuse perspiration, restlessness, difficulty in sleeping and in breathing, nausea and vomiting, and localized swelling have been reported.

Baerg soon sought the services of a physician and went to the hospital, where a series of hot baths gave him relief. He left the hospital feeling practically normal four days after the spider bite.

Last year Dr. Allan Walker Blair of the University of Alabama likewise permitted a black widow spider to bite him.

Treatment. A wide variety of therapeutic agents are reported in the literature. The real value of these has not in most cases been determined. Baerg feels convinced that the hot-water bath, as hot as the patient can endure, is by far the best measure for alleviation of the pain. He would recommend a hot bath three or four times in twenty-four hours, and believes it important that the region where the bite took place be kept in the hot water during the bath. Hot packs of 50 per cent solution of Epsom salts over the bite are said to give relief. Cutting or sucking out the poison and the use of potasium permanganate appear to be questionable and may lead to local infection. The treatment of the bite with potasium permanganate had no perceptible effect. Sodium bromide pills apparently did nothing to subdue the pain. Baerg believes the use of morphine valueless in reducing the pain. Recently the development of an anti-venom serum for the black widow bite has been reported (Becker and D'Amour). It is hoped that the effectiveness and availability of this method of treatment may soon be assured.

Preventive measures. The black widow is the only spider occurring in Oregon known to be harmful. Other spiders are harmless, interesting, and of value in maintaining nature's balance so necessary to the welfare of man. As a matter of fact, one spider, a Solpugid by name, appears to be a formidable enemy of the black widow, according to Mr. Ralph Brooke, assistant county agent, Klamath Falls. Mr. Brooke relates an intensely interesting story of a fight between these two spiders, from which the Solpugid emerged the victor.

Protection against the accidental bite of the black widow spider may be attained by freeing inhabitable dwellings of the spiders and protecting the exposed parts of the body while working in places infested by the spiders. The basements of residences, garages, and other out buildings may be kept free from spiders by diligently and persistently destroying the webs, killing the spiders and the eggs in the cocoon, using a broom or other satisfactory weapon. In doing this work, care should be exercised to prevent the spiders, in their wild scramble to escape, from dropping on to one's clothing. The seat of the outdoor toilet should be hinged in order that it may be raised for the purpose of destroying the webs and spiders that occur there. Spraying the out buildings thoroughly with a dormant oil emulsion, 5 gallons to 100 gallons of water, or a lime sulfur solution, 10 gallons to 100 gallons of water, should be of value in killing the spiders and freeing the buildings of them. Creosote spray has proved valuable as a repellent and killing agent. It may be used to spray the under side and corners of outdoor toilet seats. Fly sprays are found to act only as moderated repellents and temporarily paralyze the spider on contact. Unless the spider is crushed or otherwise killed when it falls to the floor it will recover. Tightly

screening the doors and windows of the house from basement to attic is of value in preventing the spiders gaining entrance into the house. Cleanliness and sanitation about the residence—i.e., cleaning up and destroying rubbish, weeds, dead grass, and clearing the yard of piles of tin cans, rocks, etc.—are suggested.

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